Nutrients to Support the Thyroid

The thyroid gland is one of the chief regulators of metabolic processes in the body. It sits at the front of the neck, wrapped around the trachea. Although small compared to other organs, it's one of the most important glands in the body, responsible for growth and metabolism. The thyroid is also completely reliant on two micronutrients, selenium and iodine, to work correctly.

Your thyroid controls metabolism by producing thyroid hormones, specifically T4 (thyroxine) and T3 (triiodothyronine). These two hormones control how much energy every cell and system of your body uses. It also produces calcitonin, which regulates the levels of phosphate and calcium in the bloodstream.

The pituitary gland, which sits right beneath the brain, and the hypothalamus, located within the brain control the activity of the thyroid. The hypothalamus creates and secretes thyrotropin-releasing hormone (TRH), which in turn prompts the pituitary gland to send thyroid-stimulating hormone (TSH) to the thyroid gland, which then makes and releases T3 and T4.

What Do T3 and T4 Do?

T3 and T4 are the major hormones produced by your thyroid. They're so important every cell in the body has special receptors for these hormones. T3 and T4 control:

- Heart rate
- Body temperature
- Wound healing and cellular regeneration
- Basal metabolic rate (how fast or slow every cell in the body uses energy)
- Rate of digestion
- Vasodilation. Vasodilation controls how wide blood vessels are which changes how much oxygen cells receive.
- Fertility
- Growth in children and adolescents
- Brain development in the fetus and newborns

When thyroid hormones enter cells, they work directly on the mitochondria, often called the powerhouse of the cell. In addition to many other functions, mitochondria regulate how active cells are. By slowing down mitochondria, T3 and T4 slow down tissues and organs on a cellular level. Likewise, when T3 and T4 speed up the mitochondria, cells work harder and faster, which speeds up a person's metabolism.

Everyone has a slightly different metabolic rate, which changes over time, particularly during major transitions such as adolescence and menopause. During these periods, a person's need for selenium and iodine will increase.

Iodine and Selenium for a Healthy Thyroid Gland

The thyroid gland requires several micronutrients to work in peak condition, two of which are essential: iodine and selenium. The human body can't produce iodine or selenium, so getting enough from our diet or supplementation is critical for good health.

We can get iodine and selenium from our diet, although there are few foods that contain them. In the last several years, getting enough of these two micronutrients has become more difficult. A major way of consuming iodine is through iodized salt. However, as people turn towards low-sodium diets and vegan/vegetarian diets, consumption of dietary selenium and iodine has fallen. Supplementation can remedy that deficit.

How Do Iodine and Selenium Work in the Thyroid?

Selenium is a mineral found in the soil and taken up by plants. When people consume foods with selenium, it's used by the body as an antioxidant, particularly in the thyroid gland.

That's vital because the thyroid's tissues generate lots of antioxidants when making thyroid hormones. These antioxidants can damage thyroid cells, slowing—or even halting—hormone production. Sluggish thyroid production likes to hypothyroidism, which can be a serious disorder.

Selenium is a strong antioxidant and acts as a protectant against the harm caused by antioxidants, by binding to these chemicals and allowing them to be flushed harmlessly out of the body.

Selenium is also a part of the chemical process in which the thyroid uses iodine to make T3 and T4. Without a special group of proteins made from amino acids and selenium (selenoproteins), the manufacture of T3 and T4 will slow and eventually stop.

Iodine is also an essential mineral needed by the thyroid to make T3 and T4. Iodine isn't found in many foods; that's why salt is often iodized. Like selenium, the levels of iodine in plants are dependent on how much is found in the soil. Some areas of the world have iodine-poor soils that lead to iodine deficiencies.

Iodine's mechanism of action involves a protein called thyroglobulin, which converts iodine into iodide. The thyroid takes tyrosine, a common amino acid, adds it to iodide, which yields T3 and T4.

Other Micronutrients Required by the Thyroid

The thyroid uses other micronutrients, including zinc, and vitamin A for peak performance, as well as copper, vitamin B12, and tyrosine. The roles of these elements in sustaining the good health of the thyroid aren't completely understood yet, but they're thought to contribute to the making of thyroglobulin, which is necessary for converting iodine into iodide.

Symptoms of Thyroid Hormone Deficiencies

Low levels of T3 and T4 creates a condition known as hypothyroidism which has some hallmark symptoms, including:

- Feeling cold all the time
- Inability to lose weight
- Slow metabolism
- Dry, flaky skin
- Muscle weakness
- Fatigue
- Constipation

Hyperthyroidism occurs when your thyroid pumps out too much T4. T4 travels to the liver, where it's converted into T3. Its symptoms include:

- Heart palpitations and heart arrhythmia
- Anxiety, trembling, irritability
- Goiter
- Problems sleeping
- Brittle hair, hair loss
- Increased sensitivity to heat

Supplements for Good Thyroid Health

Keeping your thyroid in peak condition isn't hard. Although selenium and iodine aren't plentiful in foods, supplementation can easily pick up the slack. The best thyroid supplements will always include selenium and iodine.

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